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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/762,494

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Kevin J. Cann

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5238

7590

11/16/2005

Univation Technologies, LLC  
Suite 1950  
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Houston, TX 77056

EXAMINER

CHOI, LING SIU

ART UNIT

PAPER NUMBER

1713

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/762,494

Applicant(s)

CANN ET AL.

Examiner

Ling-Siu Choi

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) 1-21 and 25-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/3 & 6/10/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. Claims 1-45 are now pending, wherein claims 1, 22, 25, 28, and 38 are independent claims.

### *Election/Restriction*

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-21 and 28-37, drawn to a supported chromium catalyst [chromium oxide + silica-containing support + **alkyl silanol**], classified in class 502, subclass 158.
  - II. Claims 22-24, drawn to a supported chromium catalyst [chromium oxide + silica-containing support + **an organoaluminum compound**], classified in class 502, subclass 103
  - III. Claims 25-27 and 38-40, drawn to a supported chromium catalyst [chromium oxide + silica-containing support + **second chromium-based compound**], classified in class 502, subclass 113.
  - IV. Claims 41-45, drawn to an ethylene polymer, classified in class 526, subclass 352.
3. The inventions are distinct, each from the other because of the following reasons:  
Inventions I, II, and III are unrelated. Inventions are unrelated if it can be shown

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that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP ' 806.04, MPEP ' 808.01). In the instant case the different inventions relate to a supported chromium catalyst [chromium oxide + silica-containing support + alkyl silanol], a supported chromium catalyst [chromium oxide + silica-containing support + an organoaluminum compound], and a supported chromium catalyst [chromium oxide + silica-containing support + second chromium-based compound].

Inventions (I, II, III) and IV are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions relate to a supported chromium catalyst and an ethylene polymer.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Kevin Faulkner on October 6, 2005, a provisional election was made with traverse to prosecute the invention of Group II, claims 22-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-21 and 25-45 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 102***

3. **The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:**

**A person shall be entitled to a patent unless --**

**(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**

8. Claims 22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikegami et al. (US 4,454,242).

A supported chromium catalyst comprising		
A	chromium oxide	
B	a silica-containing support selected from the group consisting of silica having	a pore volume of about 1.1-1.8 cm <sup>3</sup> /g and a surface area of about 245-375 m <sup>2</sup> /g;
		a pore volume of about 2.4-3.7 cm <sup>3</sup> /g and a surface area of about 410-620 m <sup>2</sup> /g;
		a pore volume of about 0.9-1.4 cm <sup>3</sup> /g and a surface area of about 390-590 m <sup>2</sup> /g;
C	an organoaluminum compound	
wherein the supported chromium catalyst is activated at 400-860°C		

(summary of claim 22)

Ikegami et al. disclose a catalyst comprising (A) a solid catalyst component obtained by calcining a reaction product of (a) a hydrocarbyloxy compound of titanium and (b) at least one chromium compound, the reaction product being supported on an inorganic oxide carrier and (B) an organometallic compound, wherein the inorganic oxide carrier can be silica having a specific **surface area of 200-600 m<sup>2</sup>/g**, a specific **pore volume of 1-2 ml/g**, and an average pore diameter of 50-300 Å and the chromium compound can be chromium trioxide (abstract; col. 2, lines 43-51 and 65-66). Attention is drawn to Example 1, wherein the solid catalyst component is calcined in a dried air at a temperature of 800°C (col. 11, lines 57-59). Attention is also directed to Example 15, wherein the hydrocarbyloxy compound of titanium can be titanium

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tetra(isopropoxide) (Table 2). Thus, the present claims are anticipated by the disclosure of Ikegami et al.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (US 3,759,918) in view of Ikegami et al. (US 4,454,242).

Yamaguchi et al. disclose a catalyst system comprising (1) chromium oxide supported on silica having an average pore diameter of less than 150 Å and (2) pentaalkyl siloxyalane which can be pentaethyl siloxyalane, wherein calcination activation of the chromium compound-carrier combination is accomplished in an inert atmosphere at temperatures of from 300-1,100°C (col. 3, lines 9-32; claim 1).

The difference between the present claims and the disclosure of Yamaguchi et al. is the requirement of silica having the specific pore volume and surface area in the present claims.

Ikegami et al. disclose a catalyst comprising (A) a solid catalyst component obtained by calcining a reaction product of (a) a hydrocarbyloxy compound of titanium

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and (b) at least one chromium compound, the reaction product being supported on an inorganic oxide carrier and (B) an organometallic compound, wherein the inorganic oxide carrier can be silica having a specific **surface area of 200-600 m<sup>2</sup>/g**, a specific **pore volume of 1-2 ml/g**, and an average pore diameter of 50-300 Å and the chromium compound can be chromium trioxide (abstract; col. 2, lines 43-51 and 65-66). It is noted that Yamaguchi et al. are silent on the specific pore volume and surface area. However, Yamaguchi et al. do recognize the average pore diameter which falls into the claimed range. Since the surface area and the pore volume relate to the pore diameter, the silica used in the disclosure of Yamaguchi et al. would possess the claimed surface area and pore volume. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have silica having the claimed surface area and pore volume by using the silica disclosed by Yamaguchi et al. and thereby obtain the present invention.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

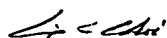
If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on 571-272-1114.



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**LING-SUI CHOI**  
**PRIMARY EXAMINER**

November 5, 2005